1. A process for manufacturing a magnetic read head structure, comprising:

providing a bottom spin valve structure having a topmost layer that is a free layer having an upper surface;

on said free layer, depositing an exchange coupling layer;

on said exchange coupling layer, depositing a ferromagnetic layer;

on said ferromagnetic layer, depositing an antiferromagnetic layer;

on said antiferromagnetic layer, depositing a conducting lead layer;

patterning and etching the structure down to a depth that is sufficient to penetrate said antiferromagnetic layer, thereby forming a gap that defines a read width for the structure;

oxidizing all of said antiferromagnetic and ferromagnetic layers that are within said gap, thereby providing for specular reflection of conduction electrons at said free layer and exchange coupling layer interface, providing an oxygen diffusion barrier, effecting improved spin filtering, and providing a protective layer for said free layer; and

heating the structure in a magnetic field whereby said ferromagnetic layer becomes permanently biased in a longitudinal direction by exchange coupling with said antiferromagnetic layer and said free layer outside of said gap becomes permanently biased in a longitudinal direction by exchange coupling with said ferromagnetic layer through said exchange coupling layer.

2. The process described in claim 1 wherein said exchange coupling layer is selected

from the group consisting of Cu, Ru, Rh, and Ag, including being a laminate of more than one member of said group.

3. The process described in claim 1 wherein said exchange coupling layer is deposited to a thickness between about 8 and 20 Angstroms.

4. The process described in claim 1 wherein said ferromagnetic layer is formed from any combination of elements selected from the group consisting of Ni, Fe, Co, Al, Ta, Cr, V, and W.

5. The process described in claim 1 wherein said ferromagnetic layer is deposited to a thickness between about 5 and 50 Angstroms.

6. The process described in claim 1 wherein said antiferromagnetic layer is selected from the group consisting of NiMn, PtMn, IrMn, RhRuMn, CrMn, PtInMn, FeMn, and NiFeMn.

7. The process described in claim 1 wherein said antiferromagnetic layer is deposited to a thickness between about 20 and 500 Angstroms.

8. The process described in claim 1 wherein said conducting lead layer is any

combination of elements selected from the group consisting of Au, Rh, Ni, Ag, Cu, Ti, and Ta.

9. The process described in claim 1 wherein said conducting lead layer is deposited to a thickness between about 50 and 500 Angstroms.

10. The process described in claim 1 wherein the step of oxidizing all of said antiferromagnetic and ferromagnetic layers that are within said gap further comprises using a method selected from the group consisting of plasma oxidation, thermal oxidation, atomic oxidation, ion beam oxidation, and reactive ion oxidation.

11. The process described in claim 1 wherein the step of heating the structure in a magnetic field further comprises heating at a temperature of between about 150 and 300 °C for between about 10 and 1,000 minutes in a magnetic field of between about 250 and 5,000 Oe.

12. A process for manufacturing a magnetic read head structure, comprising:

in succession with no intervening steps, depositing a seed layer, a pinning layer, a pinned layer, a non-magnetic spacer layer, a free layer having an upper surface , an exchange coupling layer, a ferromagnetic layer, an antiferromagnetic layer, and a conducting lead layer;

patterning and etching the structure down to a depth that is sufficient to penetrate said antiferromagnetic layer to form a gap that defines a read width for the structure;

oxidizing all of said antiferromagnetic, ferromagnetic, and exchange coupling layers that are within said gap, thereby providing for specular reflection of conduction electrons at said free layer upper surface and providing a protective layer for said free layer; and

heating the structure in a magnetic field whereby said ferromagnetic layer becomes permanently biased in a longitudinal direction by exchange coupling with said antiferromagnetic layer and said free layer outside of said gap becomes permanently biased in a longitudinal direction by exchange coupling with said ferromagnetic layer through said exchange coupling layer.

13. The process described in claim 12 wherein said exchange coupling layer is selected from the group consisting of Cu, Ru, Rh, and Ag, including being a laminate of more than one member of said group.

14. The process described in claim 12 wherein said exchange coupling layer is deposited to a thickness between about 3 and 20 Angstroms.

15. The process described in claim 12 wherein said ferromagnetic layer is formed from any combination of elements selected from the group consisting of Ni, Fe, Co, Al, Ta, Cr, V, and W.

16. The process described in claim 12 wherein said ferromagnetic layer is deposited to a thickness between about 5 and 50 Angstroms.

17. The process described in claim 12 wherein said antiferromagnetic layer is selected from the group consisting of NiMn, PtMn, IrMn, RhRuMn, CrMn, PtInMn, FeMn, and NiFeMn.

18. The process described in claim 12 wherein said antiferromagnetic layer is deposited to a thickness between about 20 and 500 Angstroms.

19. The process described in claim 12 wherein said conducting lead layer is any combination of elements selected from the group consisting of Au, Rh, Ni, Ag, Cu, Ti, and Ta.

20. The process described in claim 12 wherein said conducting lead layer is deposited to a thickness between about 50 and 500 Angstroms.

21. The process described in claim 12 wherein the step of oxidizing all of said antiferromagnetic and ferromagnetic layers that are within said gap further comprises using a method selected from the group consisting of plasma oxidation, thermal oxidation, atomic oxidation, ion beam oxidation, and reactive ion oxidation.

22. The process described in claim 12 wherein the step of heating the structure in a magnetic field further comprises heating at a temperature of between about 150 and 300°C for between about 10 and 1,000 minutes in a magnetic field of between about 250 and 5,000 Oe.

23. A magnetic read head structure, comprising:

a bottom spin valve structure having a topmost layer that is a free layer having an upper surface;

on said free layer, an exchange coupling layer;

on said exchange coupling layer, two opposing plugs of a laminate of a conducting lead layer on an antiferromagnetic layer on a ferromagnetic layer, said plugs being separated by a gap that defines a read width for the structure;

in said gap, a layer of oxides of said antiferromagnetic, ferromagnetic, and exchange coupling layers, said oxide layer being a protective layer for said free layer and providing for specular reflection of conduction electrons at said free layer upper surface; and

said ferromagnetic layer being permanently biased in a longitudinal direction by exchange coupling with said antiferromagnetic layer and said free layer outside of said gap being permanently biased in a longitudinal direction by exchange coupling with said antiferromagnetic layer through said exchange coupling layer.

24. The structure described in claim 23 wherein said exchange coupling layer is selected

from the group consisting of Cu, Ru, Rh, and Ag, including being a laminate of more than one member of said group.

25. The structure described in claim 23 wherein said exchange coupling layer has a thickness between about 3 and 20 Angstroms.

26. The structure described in claim 23 wherein said ferromagnetic layer is selected from the group consisting of NiFe, CoFe, and a combination of CoFe and NiFe.

27. The structure described in claim 23 wherein said ferromagnetic layer has a thickness between about 5 and 50 Angstroms.

28. The structure described in claim 23 wherein said antiferromagnetic layer is selected from the group consisting of NiMn, PtMn, IrMn, and RhRuMn.

29. The structure described in claim 23 wherein said antiferromagnetic layer has a thickness between about 20 and 500 Angstroms.

30. The structure described in claim 23 wherein said conducting lead layer is any combination of elements selected from the group consisting of Au, Rh, Ni, Ag, Cu, Ti, and Ta.

31. The structure described in claim 23 wherein said conducting lead layer has a thickness between about 50 and 500 Angstroms.

32. The structure described in claim 23 wherein said gap is between about 0.02 and 0.5 microns wide.

33. A magnetic read head structure, comprising:

a bottom spin valve structure having a topmost layer that is a laminate of CoFe and NiFe layers, said laminate being a free layer having an upper surface;

on said free layer, an exchange coupling layer that is a laminate of Cu and Ru;

on said exchange coupling layer, two opposing plugs of a conducting lead layer on an antiferromagnetic layer on a ferromagnetic layer, said plugs being separated by a gap that defines a read width for the structure;

in said gap, a layer of oxides of said antiferromagnetic and ferromagnetic layers, said oxide layer being a protective layer for said free layer and providing for specular reflection of conduction electrons at said free layer upper surface; and

said ferromagnetic layer being permanently biased in a longitudinal direction by exchange coupling with said antiferromagnetic layer and said free layer outside of said gap being permanently biased in a longitudinal direction by exchange coupling with said antiferromagnetic layer through said exchange coupling layer.

34. The structure described in claim 33 wherein said exchange coupling layer contains between about 30 and 70 atomic percent of Ru.

35. The structure described in claim 33 wherein said exchange coupling layer has a thickness of about 10 Angstroms.

36. The structure described in claim 33 wherein said ferromagnetic layer is CoFe.

37. The structure described in claim 33 wherein said ferromagnetic layer is about 45 Angstroms thick.

38. The structure described in claim 33 wherein said free layer further comprises about 10 Angstroms of CoFe on about 20 Angstroms of NiFe.

39. The structure described in claim 33 wherein said gap is between about 0.02 and 0.5 microns wide.